

# SWARTHMORE

COLLEGE BULLETIN

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Invent Xanadu, Fantagraph, Kitchensync, and Cinenym

Design a Zoo



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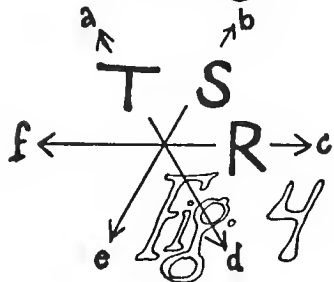
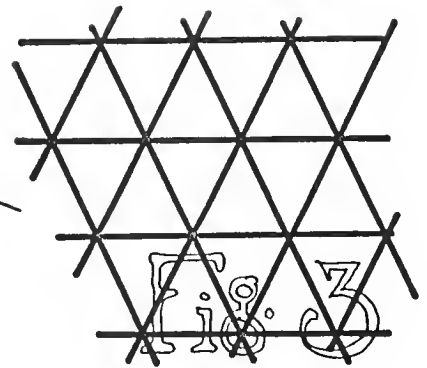
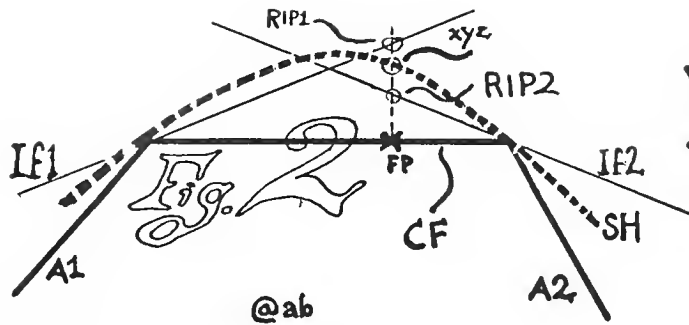
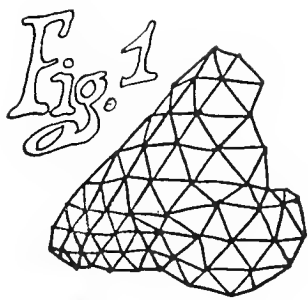
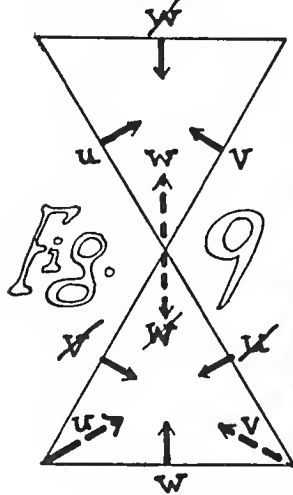
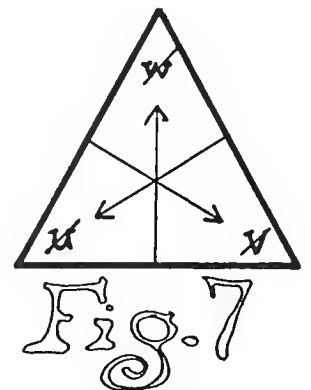
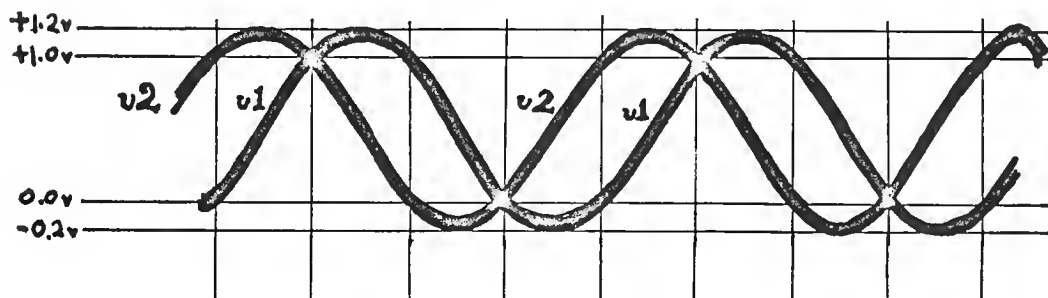
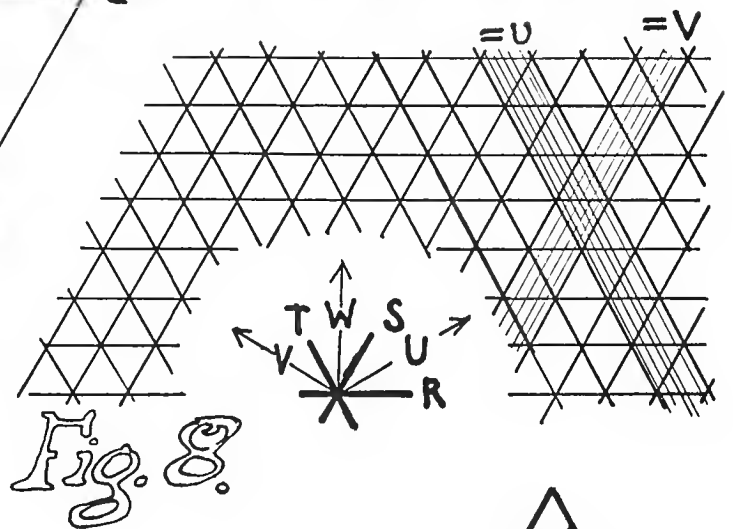
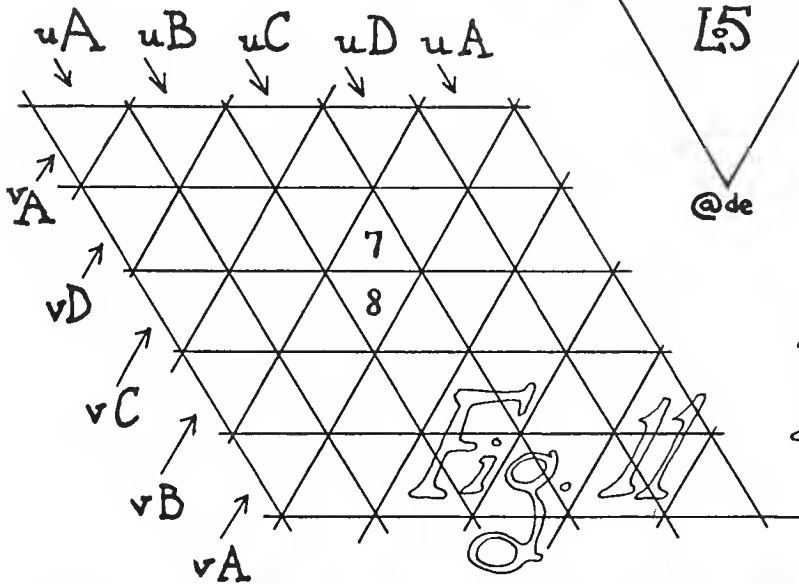


Fig. 6



**BARNUM**

by Theodor H. Nelson '59



A turning point in your life is not generally something you plan in advance. When I got out of Swarthmore I wanted to be a movie director, so what I was doing in graduate school is hard to explain. But I thought of myself as a writer and showman and looked back with enjoyment upon various innovations I had pulled in magazines and shows I had produced. Perhaps most important, I had developed an immunity to conventional advice, based on the eventual vindication of various large projects. I looked forward to a career in writing and films after I had picked

screen and respond to actions by somebody at a keyboard.

4. Computers can make pictures.

Suddenly it was all clear to me. There was soon going to be a whole new world, where all forms of presentation are fabulously computer-controlled from scripts stored in the machines which unfold according to viewers' reactions.

This vision cut across everything I was interested in, and its problems were not narrow and technical; they were matters of writing and showmanship! There was to be a whole new field of computer-controlled

computers on my own with unending phone calls, attendance at conferences, and reading, especially the manufacturers' free literature. I made a living any way I could, which included a sojourn with Dr. Lilly's dolphins in Miami, professional folk singing, and teaching sociology at Vassar. I began to publish and speak at conferences. The Defense Ministries of Czechoslovakia and Norway asked me for reprints. I felt I was getting somewhere. The Third, or Mobile, Phase began.

I gave papers and made proposals

# TRONICS

as told to Theodor H. Nelson '59

To program Renaissance humanism for computers of the future, says the author, Gutenbergs, D. W. Griffiths, and P. T. Barnums are called for, not engineers

up a teaching degree for safety.

But the turning point came, of all places, in a course on computer programming. An old mathematical incompetent, I was astonished to learn the following:

1. The computer is the most misunderstood and misrepresented entity on land or sea.

2. Computers aren't just for numbers. In fact, numbers are just a special case. The computer is a magical detail man, capable of carrying out almost anything you can reduce to an orderly process.

3. Computers can put words on a

presentation that needed not engineers, but Gutenbergs, D. W. Griffiths, P. T. Barnums! Here, in short, was what all my training had led to accidentally.

Through many long walks at night, and various sessions of leaping heart, I consecrated myself to creation of a better and more interesting world, using computers to show things and help people create things to be shown. ("Fantics" I now call this field. Its scope will be best apprehended if you consider that both writing and movies are things to be shown.)

My life since then can be described in the fashionable revolutionary terms. During the Long March (till about 1966) I studied

and talked up my ideas and took jobs at big companies, trying to get my inventions and approaches realized. But it didn't go over. People liked this invention or that idea, but refused the overall picture, the philosophy so important to either my apocalyptic predictions or the nuances of my designs. Many computer people seemingly didn't like my stuff because they felt it violated the way God intended computers to be used. And laymen evidently had their own reasons for distrust.

Yet my message is so simple:

1) Knowledge, understanding and freedom can all be advanced by the promotion and deployment of computer display consoles (with the

*continued on next page*

*Nelson uses a full page of drawings to explain the geometry of one version of his Fantasm machine to the Patent Office.*



*At the 2250 console, Inventor Nelson anticipates the forthcoming "age of prestidigitative presentation and publishing."*

right programs behind them).

2) Computer presentational media, coming soon, will not be technically determined but rather will be new realms for human artistry. This point of view radically affects how we design man-machine systems of any kind, especially those for information retrieval, teaching, and general writing and reading. Some practitioners see such systems as narrowly technical, with the computer hoisting up little pieces of writing on some "scientific" basis and showing them to you one grunt at a time. A Metrecal banquet. I disagree. The systems should be opulent.

3) The problem in presentational systems of any kind is to make things look good, feel right, and come across clearly. The things that matter are the feel of the system, the user's state of mind, his possible confusion, boredom or enthusiasm, the problems of communicating *concepts*, and the very nature of concepts and their interconnection. There will never be a "science" of presentation, except as it relates to these things.

4) Not the nature of machines, but the nature of *ideas*, is what

matters. It is incredibly hard to develop, organize and transmit ideas, and it always will be. But at least in the future we won't be booby-trapped by the nature of paper. We can design magic paper.

It is time to start using computers to hold information for the mind much as books have held this information in the past. Now information for the mind is very different from "information for the computer" as we have thought of it, hacked up and compressed into blocks. Instead we can stretch the computer.

I am proposing a curious kind of subversion. "Let us design," I say; and when people see the systems, everybody will want one. All I want to do is put Renaissance humanism in a multidimensional responsive console. And I am trying to work out the forms of writing of the future. Hypertexts.

Hypertexts: new forms of writing, appearing on computer screens, that will branch or perform at the reader's command. A hypertext is a non-sequential piece of writing; only the computer display makes it practical. Somewhere between a book, a TV

show and a penny arcade, the hypertext can be a vast tapestry of information, all in plain English (spiced with a few magic tricks on the screen), which the reader may attack and play for the things he wants, branching and jumping on the screen, using simple controls as if he were driving a car. There can be specialized subparts for specialized interests, instant availability of relevancies in all directions, footnotes that are books themselves. Hypertexts will be so much better than ordinary writing that the printed word will wither away. *Real writing by people*, make no mistake, not data banks, robot summaries or other clank. A person is writing to other people, just as before, but on magical paper he can cut up and tie in knots and fly around on.

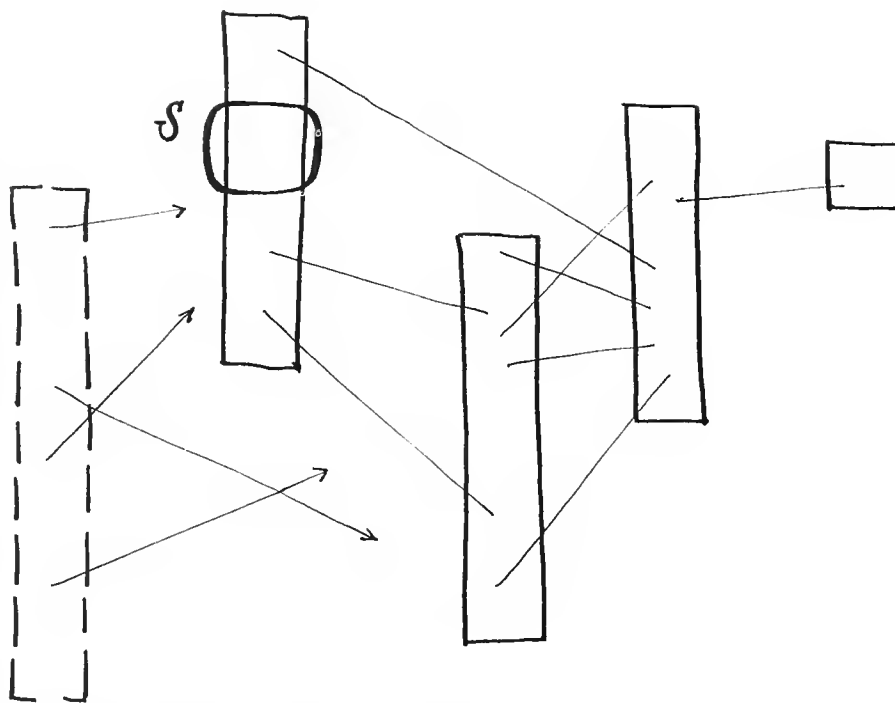
A few of my ideas have been put into practice. Andries van Dam '60, now associate professor of computer science at Brown University, instigated a text project partly at my urging. Taking off from a document I wrote, he and his students put together a big computer program which we argued about endlessly over the

telephone. The result, the Brown University Hypertext Editing System, is one of the more powerful text-editing systems in the world. On the screen you can whisk through your manuscripts, swiftly change them, and connect them up any which way into hypertexts—hence the name Hypertext Editing System.

I see this as only the beginning. My Xanadu system will go much farther. I think of Xanadu as the fundamental text system of the future, the magic carpet of the mind. The basic idea is that the computer should be able to hold your writings and thoughts in at *least* the complexity they have in your mind (unlike paper, where thoughts must be truncated and parodied), with every cross-link and annotation you want to put in. Through all this you may zoom like a bird in an enchanted forest. The system will help you ponder complex theories and compare variations of what you're studying or creating; it should also allow you to go back in time through earlier versions of your work, perhaps building again on drafts you thought you had discarded. You can sift and combine your notes into a conventional work or leave it all hanging in a huge controlled agglomeration. The system will help integrate syntheses, unravel inspirations, deconfuse thought. But, of course, you may read and write hypertexts. Every kind of human creativity—not just writing—can be aided if we build a sufficiently general creativity console, such as Xanadu.

Although early systems of this type will cost unspeakable amounts of money, later in the seventies it should be possible to outfit an entire college campus, for example, for a few thousand dollars per console. Think of not having to hand in your seminar paper physically; zip it instead to the antechambers of your readers' consoles with the bump of a button.

Besides these visions, which only get technical at certain key points,



*A simple hypertext appears on a television screen. The long strips are documents it can roam over. Not only can viewer leap along the connection lines indicated; he can also add indexes and commentaries to help in mutual comparison (dashed strip)—a facility of Xanadu system, "the magic carpet of the mind."*

I have also worked all these ten years on my pseudo-photography system, Fantasm. No one yet accepts my contention that you will be able to make realistic movies with Fantasm showing sets and actors that don't really exist. However, recent successes by others who have adopted this approach—notably at the University of Utah—indicate that I have been on the right track all along. There is no room here to do more than mention my other movie-making systems (Cinenym, Fantagraph and Kitchensync).

My odyssey through the computer world has been interesting. Many lunches have I been fed, in mighty executive dining rooms. Strange installations have I seen, working and nonworking, all wondrous to recount. The endless delights of endless business discussions of forming new corporations for public registration have been mine. Eventually I acquired patience and The Nelson Organization, Inc., which may not be much, but it's home (literally). I scrape by lecturing and doing weird consulting

jobs (would you suppose my hypertexts were relevant to the ABM system? Would you believe the telephone company?). Until it's time.

So far my predictions have been generally right except for chronology. I originally thought the printed word might be eliminated by 1970 or 1972. Now, uh, I guess it will take a little longer. ("Is Nelson paranoid?" asks a recent letter to *Computer Decisions* magazine.) But it's going to happen. Computer screens will be in the home, perhaps sooner than in the school. No more graveyards of paper for the words we write. No more pencils, no more books, no more teachers' dirty looks.

Ladies and gentlemen, the age of prestidigitative presentation and publishing is about to begin. Palpitating presentations, screen-scribbled, will dance to your desire, making manifest the many mysteries of winding wisdom. But if we are to rehumanize an increasingly brutal and disagreeable world, we must step up our efforts. And we must hurry. Hurry. Step right up.